

Freedom of science

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Abstract

Purpose – The purpose of this paper is to highlight the importance of “freedom of science” (“academic freedom”) for the advancement of society and mankind, which, however, is permanently endangered by powerful organisations, groups and individuals, who in pursuit of their one-sided interests are seeking to constrain information about the truth. As a broad term, freedom of science embraces freedom in research, learning, teaching and publication. All of these activities should be dedicated to identifying the truth and learning about the truth.

Design/methodology/approach – Three theoretical approaches are of importance for framing issues related to freedom of science, which in this paper are integrated into the framework of mindset agency theory: freedom is a value; “freedom” is claimed by agents who pursue specific interests (goals), which might constrain others; and individuals are agents who are interacting with each other within a social system – cooperation, ignorance or conflict.

Findings – Freedom as a value is at the core of intellectual autonomy. Intellectual autonomy is a necessary condition for innovation and advancement of knowledge. The observable modes of interaction/coexistence among researchers are influenced by individual research goals and by the researchers’ access to resources, which may be deliberately constrained by opponents or other researchers as competitors.

Research limitations/implications – For further research, which is beyond this paper, the authors can refer to: analyses of challenges of “academic freedom” – in terms of ethics, protection of individual human rights, political pressures and conflicts of interests; the issues of truth, i.e. the impact of fake news and creation of “alternate facts”; and the relation between academic freedom and employment (academic tenure) in present-day societies. Owing to lack of space, this paper cannot deal with the danger emerging from powerful organisations or powerful individuals, who are challenging freedom of science.

Social implications – If there is no freedom of science then social progress is constrained. If there is no access to right data, decisions will be wrong.

Originality/value – So far, a comprehensive cybernetic model was not published, which supports systems thinking about scholars and teachers (inter)acting in research organisations.

Keywords Cooperation, Systems theory, Agency theory, Conflict, Evolution, Political goals, Purpose of research, Resource dependence, Survival, Tenure

Paper type Research paper

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1. Introduction

The principle of “freedom” is permanently challenging “borders”, i.e. interests in other domains of life, which seemingly are worth to be defended by specific groups in society. In present days, within the framework of “freedom of science” most notable are issues of ethics, protection of

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human rights, personal dignity and personal integrity, “quality management” through peer review of publications, “quality management” through accreditation agencies owned by large private companies, big data approaches vs protection of individual rights, etc.[1].

The Declaration of the Rights of Man and of the Citizen of 1789 defined liberty in Article 4 as follows: “Liberty consists of being able to do anything that does not harm others: thus, the exercise of the natural rights of every man or woman has no bounds other than those that guarantee other members of society the enjoyment of these same rights.” [See, among many other sources: [Censer and Hunt \(2001\)](#), [Doyle \(1989\)](#) or [Wikipedia \(2018b\)](#) on Libert ,  galit , fraternit ].

In Austria, the issue of “Freiheit der Wissenschaft” was first claimed in Vienna, during the revolution and uprisings in March-October 1848. However, not before 21 December 1867, it became Austrian constitutional law as Article 17 of the Austrian “Staatsgrundgesetz”, signed by Emperor Franz Joseph I, only after the Austrian army had lost another decisive war of extermination waged by Prussia against Austria at K niggr tz. In today’s Republic of Austria, the principle of “freedom of science” still is valid. In November 1918, it was taken over into the constitution of the new “Republic of Austria”.

In the USA, in 1915 the Committee on Academic Freedom and Academic Tenure of the American Association of University Professors formulated a statement of principles on academic freedom and academic tenure, which was adapted and re-indorsed in 1940 and in 1970 with interpretive comments ([AAUP, 2018a, 2018b, 2018c, 2018d](#)).

In the past century, a major challenge was the issue of survival of universities under suppressive regimes and dictatorship, such as in Nazi-Germany, in the Soviet Union, in Franco’s Spain and in Mussolini’s Italy. Of interest is also the contribution of established scholars to the demise of repressive systems, e.g. Andrei D. Sacharow and the Dissident Movement in the Soviet Union in the 1970s.

In this context, it is interesting to note that universities have been in continuous operation in Europe for more than 900 years (University of Bologna, 1088). In 1158, the German Emperor Frederick I Barbarossa issued the “Authentica habita”, which settled the rules, rights and privileges of universities. “The document grants several rights and protections to scholars including:

- similar immunities and freedoms as those held by the clergy, provided they conformed to certain attributes, such as clerical dress;
- freedom of movement and travel for the purposes of study;
- immunity from the right of reprisal; and
- the right to be tried by their masters, or the Bishops court, rather than local civil courts”. [See: [Schalm \(2008\)](#), [de Ridder-Symoens \(1992\)](#); [Encyclop dia Britannica \(2010\)](#); [Wikipedia \(2018a\)](#), Authentica habita.]

Thus, over the centuries universities existed with and without freedom of science, universities contributed to the emergence of new and important knowledge and they survived (and often also supported) suppressive regimes, which on the other hand often did not hesitate to remove, to exile or have killed individual scholars or whole schools of scientific research if the researchers and/or their research findings were not in the interest of the “strong leaders”.

For comparison: Most of the “oldest companies” in the world, founded before 1300, are restaurants, breweries, beer cellars, wine cellars and hotels, with less than 300 employees. The oldest organisation in Europe seems to be the Catholic Church, which also survived numerous challenges and spin-offs, such as the Orthodox and Protestant Churches, the Church of England and the Old Catholic Churches. Large commercial companies are not among the long term survivors.

The paper is structured as follows. The next section of the paper provides a theoretical frame of analysis dealing with “freedom” as a value, the four modes of coexistence in social systems and with a systems theory approach to goals and responsibilities of researchers and of research organisations, which has the capacity to integrate into a single theoretical framework: values, patterns of behaviour, and the driving forces of behaviour.

Different aspects of the systems theory approach are illustrated by five figures:

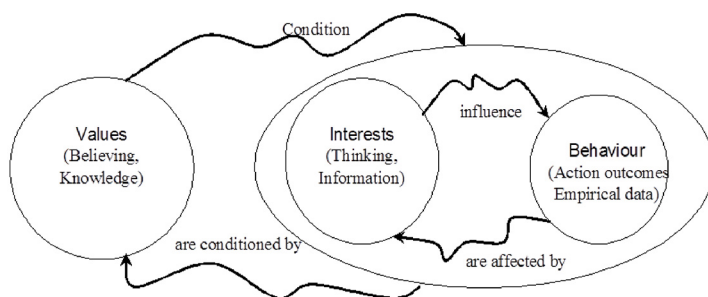
- the relations between values, interests and behaviour of a personality (Figure 1);
- an extended viable systems model with a research environment and a resource providing environment (Figure 2);
- competition for resources: two agencies interacting in a resource environment (Figure 3);
- scholars embedded into higher order systems (Figure 4); and
- a three level interaction model between institutions/organisations at the society level, universities and research organisations, and scholar personality (Figure 5).

The systems theory model is the framework for discussion of the relations between society and individuals, the role of needs and desires as driving forces of behaviour and organisation and purpose, which determine differentiation in political orientations and impact cooperation between scholars among universities and research organisations.

2. Systems theory in management as a theoretical frame of analysis

Figure 1 shows the symbolic relationship between three levels of a social system: believing, thinking/feeling and doing/action. In a way thinking and related interest influence our behaviour. As a feedback the outcomes of our behaviour influence our thinking and related interests. Values influence thinking and behaviour, as a feedback values in turn are conditioned by thinking and behaviour, i.e. feasible interests might be considered to drive values. Three theoretical approaches are of importance for framing issues related to freedom of science:

- “Freedom” is a value. Values have a regulatory role in social systems and are interacting with other values. For a brief analysis we shall refer to Schwartz (2006), Sagiv and Schwartz (2007); and Moonen (2018a and 2018b).
- “Freedom” as a value is claimed by agents, who pursue specific interests (goals), which may correspond to the interests of other agents or not. Congruence of goals or goal conflict is leading to four different modes of coexistence in social systems: cooperation, niche, conflict or subordination/hierarchy (Nechansky, 2016, 2017).



Source: Fink 2018 (p. 227)

Figure 1.
Values, interests and
behaviour of a
personality

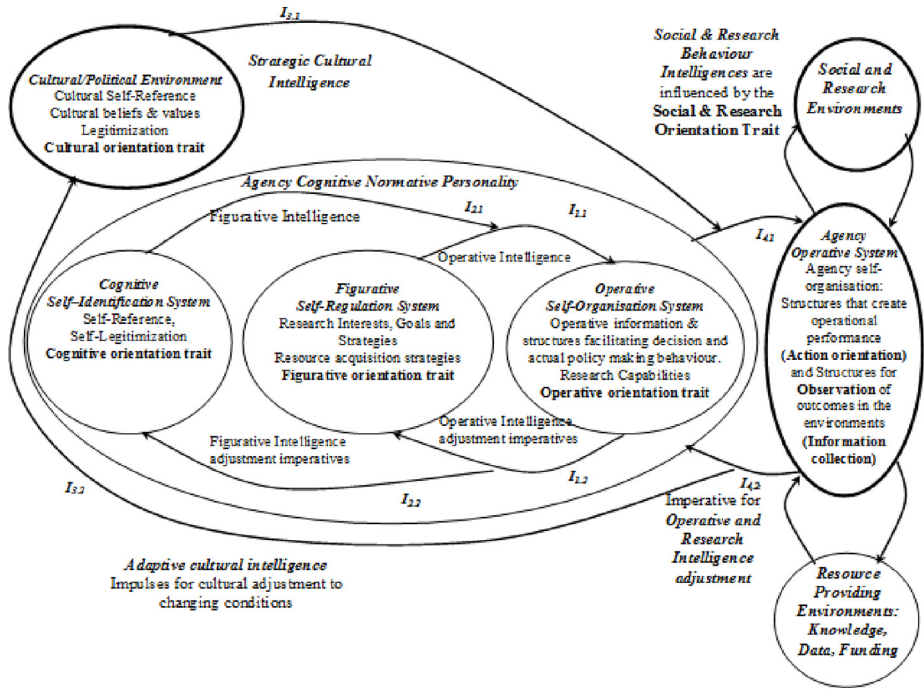


Figure 2.
Extended viable systems model with a research environment and a resource providing environment

Note: Intelligences ij , have order $i = \{1, 4\}$; and have feedforward $j = \{1\}$ or feedback $j = \{2\}$
Source: Fink 2018 (p. 229)

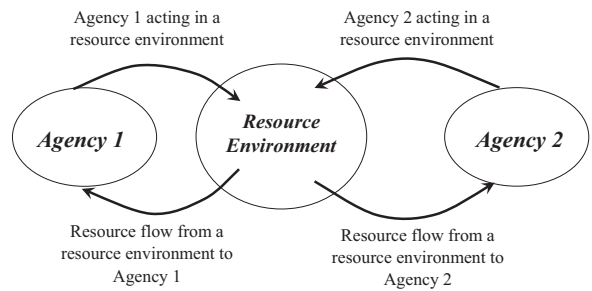


Figure 3.
Competition for resources: two agencies interacting in a resource environment

Source: Fink 2018 (p. 231)

- Individuals as agents are interacting with each other within a social system. Thus they are embedded into a social system, which may have a variety of agents in pursuit of different interests. However, social systems as a higher order “personality” may interact with other social systems in a joint cultural environment, and/or in a task environment. For illustration we shall refer to mindset agency theory (Yolles and Fink, 2014; Fink, 2018).

When in this paper we are referring to “agency”, we have in mind the broader concept of “living systems” which have “agency”, i.e. the capacity to set coordinated action in pursuit of “collective goals” and a strategy to reach such shared goals. Agency is “the capacity of an actor to act in a given environment” and “provides some service for another”. It represents an activity system composed of agents, has living system properties indicated by its institutional dimensions.

This broader concept relates also to the term of a “normative personality”, which is constituted by a social system (e.g. an organisation) which embraces individuals. For the term “agent” we have in mind a narrower concept with focus on an individual. Thus, “agency” implies a set of individuals as perhaps interacting “agents”.

As “norms” we understand “social norms”, i.e. formal and informal understanding how individuals (agents) should behave within a social system (Chung and Rimal, 2016).

2.1 “Freedom” as a value in the category “intellectual autonomy”

Shalom Schwartz (1992, 1994, 2006) with his “Schwartz value inventory” identified “freedom” as a value of self-direction: those who seek self-direction enjoy being outside the control of others and autonomous. In their paper on cultural values in organisations, Sagiv and Schwartz (2007) stated that “freedom” is closely related to the values “broadmindedness”, “creativity” and “curious” and gave the label “intellectual autonomy” to the group of these four values. Self-direction implies “reliance upon one’s own judgment and comfort with the diversity of existence” and is in an opposite position to the values related to security (Schwartz, 2012, p. 9), which are grouped by Schwartz (2006) into the category “embeddedness”, and among others put strong emphasis on obedience, respect of tradition, social order, national security, and protection of public image.

When looking for important traits of “a scientist” one finds “curiosity” in any list of basic characteristics of a good scientist. For an analysis of important factors explaining the innovative strength of nations, Moonen (2018a) set up the hypothesis that values of self-direction will have a positive relation with innovation initiation and innovative strength: feeling independence of thought and decision, exploration of creativity, being curious, choosing own goals and being outside control of others. Finally, after a thorough analysis of all values in the Hofstede framework (Hofstede *et al.*, 2010) and the Schwartz framework, (1999, 2004), Moonen (2018b) found that at national level five values are positively correlated with the global innovation index (Dutta, 2015): Openness to change 0.313, self-effacement 0.281, egalitarianism 0.204, intellectual autonomy 0.189, small power distance 0.182 and self-enhancement 0.181.

In addition, Moonen (2018b) also found that beyond values preferred types of management behaviour, i.e. major characteristics of leadership styles, have an impact on

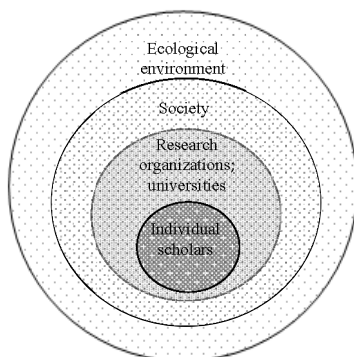


Figure 4. Scholars embedded into higher-order systems

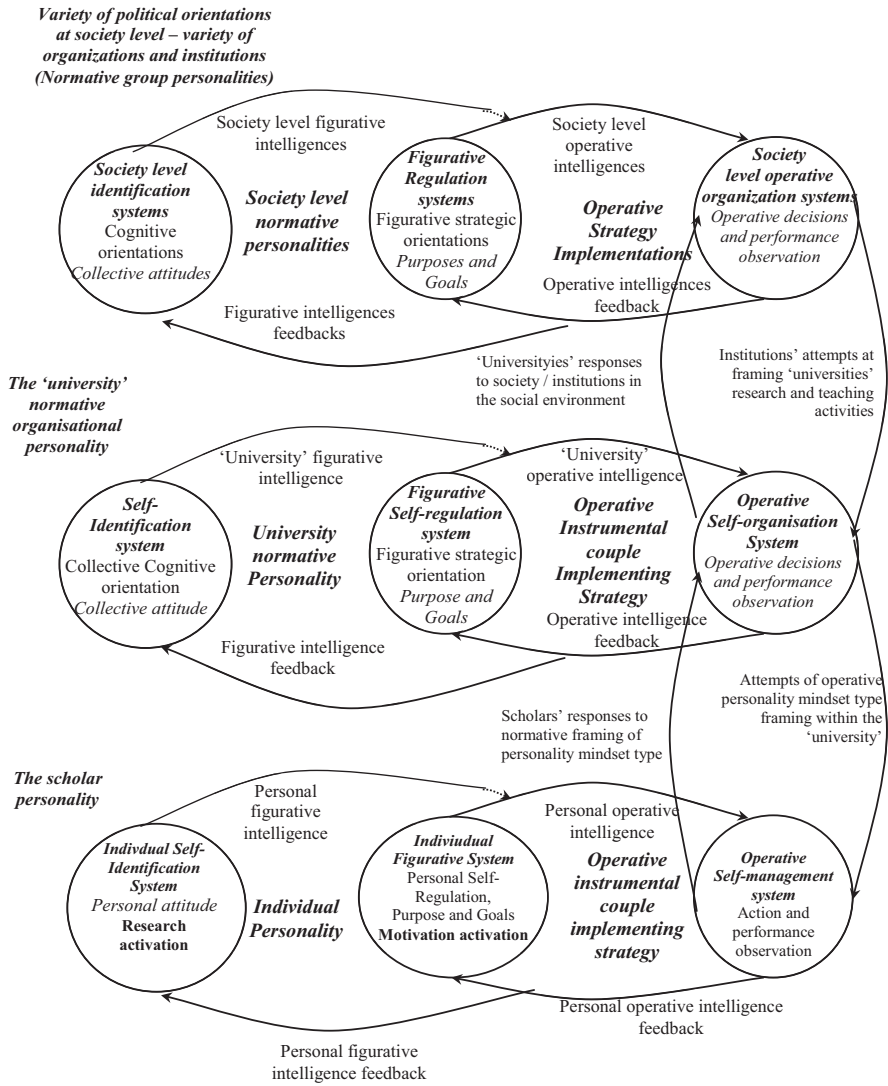


Figure 5. Three-level interaction model between institutions/ organisations at the society level, universities and research organisations and scholar personality

innovativeness: joint decision-making 0.187, innovative 0.164, empowering 0.149 and the ability to anticipate change 0.134.

This result is supported with a factor analysis, where only one factor has a significant strong positive correlation with creative outputs, i.e.:

- Factor 2 – with the cultural values: openness to change, intellectual autonomy and open-minded
- Two other factors have a significant negative correlation with creative outputs
- Factor 1 – with cultural values traditionalism and conservation

- Factor 3 – with cultural values wellness and cooperative under any condition
- One factor does not show a significant correlation: i.e. Factor 4 with cultural values free community and easy-going.

Thus, we come to the conclusion that freedom of science is strongly related to “intellectual autonomy”, i.e. the freedom of thinking. In a similar vein, in his book the “Philosophy of Freedom” the Austrian Philosopher Rudolf [Steiner \(1995, 1893/1894\)](#) had emphasised the need of a society based on the three basic values of the French revolution: “freedom, equality, and fraternity”, where freedom in human thinking is central for any freedom. Free thinking about the relationship between knowledge and perception is indispensable, and it is important to understand the role and reliability of free thinking as a means to knowledge. (See also [Wikipedia, 2018b, 2018c.](#))

Considering the “constraints” on freedom as attributed to the value of freedom in Article 4 of the Rights of Men, and the fact that scholars of universities or other research organisations have tied themselves to the organisation with a contract regulating pay (salaries) and describing at large their duties in research, teaching, learning and management of the organisation, it seems to be clear that there is no “absolute freedom”.

2.2 *The four modes of coexistence in social systems* ([Nechansky, 2017](#))

Research is a goal oriented activity. Researchers are aiming at advancing knowledge through achieving specific new insights. Research mostly is undertaken within social contexts, e.g. at universities or research institutes. Such institutions constitute social systems which also supply and distribute resources for research to be undertaken. Therefore it is important to understand the modes of coexistence of agents within social systems.

Since 2006, in a series of almost 20 papers Helmut Nechansky developed a theory explaining “The four modes of coexistence in social systems” ([Nechansky, 2017](#)). The basic idea is that in a social system, similarity and difference between goals of agents has a strong impact on the capability and willingness of agents either to cooperate or rather to get into conflict with other agents. However, at the individual one also might have to distinguish “*inclinations*” for interaction modes ([Nechansky, 2016](#), pp. 92-93):

- inclination for an upper position in a hierarchy; corresponding behaviour is aggressive;
- inclination for a lower position in a hierarchy; corresponding behaviour is aimlessly drifting or submissive;
- inclination for the niche; resulting behaviour is independent; and
- inclination for cooperation; the behaviour is cooperative.

In his paper on “The four modes of coexistence in social systems” ([Nechansky, 2017](#)) he finds that “in most cases, one will be able to identify the four modes of coexistence directly in *available descriptions of the behaviour* of interacting parties. Here the four classification criteria are quite obvious:

- (1) *Conflict*: The parties lack mutual goal-values and try to aggressively enforce their own goals and interests against others.
- (2) *Hierarchy*: At least one party does not pursue own goal-values, but submits to and works towards the goal-values of another party.
- (3) *Niche*: Parties avoid or minimise interactions trying to realise own goal-values widely alone.

- (4) *Cooperation*: Parties are ready to negotiate to compromise and to stipulate mutual goals-value to realise them together with others.” (Nechansky, 2017, p. 436).

Considering the world of research, from a more general perspective, we may find that three aspects are of importance:

- (1) The goals connected to a specific research effort.
- (2) Access to resources needed to perform a research effort (knowledge, finance, staff, experimental fields, disclosed information, etc.)
- (3) The distribution of the expected benefits from goal achievement.

Thus, the observable modes of interaction/coexistence among researchers may be strongly influenced first of all by research goals, but secondly also by the strategies which can be unfolded based on access to resources, and not least by the expected benefits/returns from goal achievement.

If there is lack of resources, certain goals cannot be pursued. If an agent disposes of sufficient/abundant resources the agent may decide not to cooperate, because in that case the agent can reap alone all benefits from goal achievement. If an agent has no access at all to resources but specific capabilities, the agent may decide to subordinate to a research team leader, who decides about the goals, the strategy, and the future distribution of the benefits achieved from research.

2.3 A systems theory approach to goals and responsibilities of researchers and their organisations based on mindset agency theory

The general proposition is that for understanding “freedom of science” one has to consider action-outcome-consequence relations triggered by the claim of “freedom of research”; the interests of other researching agencies (social systems), individuals, teams and organisations; the capabilities and achievements of other researching agencies; and access to and competition for resources.

Figure 1 illustrates the basic principles of a social viable systems model (a normative personality), as developed by Yolles and Fink (2009): “Consider that our interests influence our behaviour and our behaviour is leading to outcomes - observable phenomena. In turn, reflection on these outcomes influences thinking. Thus, interests are affected by outcomes of action and self-reflection (thinking) about these outcomes. Our values condition our thinking and behaviour. But, when given values do not lead to desired outcomes, our interests may induce change in values. In that sense, values are conditioned by interests, which may ‘drive’ values” (Fink, 2018, p. 227).

Figure 1 represents a hierarchy which can be connected to frequently cited management literature. “The hierarchical structure between these domains can be further extended through integration of the views expressed by Hatch and Cunliffe (2006). Visible behaviour influences and is influenced by unobservable assumptions through rules, standards and prohibitions. Thus, “unobservable assumptions” correspond to “organisational culture and identity”. Espoused values correspond to “organisational strategy”. “Artefacts” comprise observable phenomena, which in the organisational context are: “organisational design, structure and processes” and “organisational behaviour and performance”. Finally, organisational behaviour is directed towards an external operative or “task environment”, but also towards an external “legitimation environment” (Dauber *et al.*, 2012; Fink, 2018, p. 227).

“Freedom” may have different meaning in different contexts, i.e. depending on the “cultural/political environment”, which may provide legitimisation and guidance. However, a hostile or dictatorial “cultural/political environment” may constrain “freedom of research” to some specific research interests, e.g. development of weapons, missiles and bombs. Political leaders may surround themselves with scholars who give them “legitimisation” through new research results.

Next, the research agency is organizing itself. In an “agency operative system”, with self-organisation the research agency generates structures which are controlling action, leading to performance in a social (research) environment. To be able to control its own behaviour there is also need of information collection within the social system and in the social environment, most notably the capacity to make appropriate observations about the consequences of own action in the social environment: “observation” of the results/outcomes from action in the environments and observation of the action and research achievements of other agents in the environment: e.g. performance at international conferences, publications, citations and other criteria depending on the research field.

Finally, an agency (a researcher, a research organisation) has to secure access to the necessary resources, which are needed for creating performance and achieving new (innovative) research results. Thus, we should explicitly consider a “resource environment”, where resources are generated/acquired for the purposes of research, but where other agents are also active to secure their own research resources, what may include copying the achievements of others. Thus, we shall need a follow-up consideration about the general effects of interactions of two agencies in its resource environment and in the research environment.

In [Figure 2](#) we show an extended viable systems model, which is including a cultural/political environment, an agency operative system, social and research environments and a resource providing environment.

Because agencies are operatively interacting with other agencies in a social and research environment, but also in a resource providing environment, common goals are apparently not sufficient to secure cooperation between two agencies. If for an agency a certain research goal is of high importance, the agency may be strongly interested that others cannot pursue the same research goals and thus, will try to prevent others from getting access to necessary resources. Thus, common goals do not exclude conflict over access and use of resources.

3. Society and individuals, needs and desires, organisation and purpose

The proposition of mindset agency theory is that societies are embedded into an ecological environment and consist of individuals who organise themselves into groups, teams, or larger organisations, which in most instances as organised and focused systems are much more efficient in pursuit of specific purposes in comparison to separated individuals who – as separated niche players or in conflict with others – are pursuing satisfaction only of their individual needs and desires.

As an illustration of the embeddedness of research organisations (universities) into society and an ecological environment we refer to [Figure 4](#).

Considering the need of academic freedom, we can identify various forms of research organisations focused on advancement of knowledge (through research, teaching and learning), which are embedded into a society, and in turn, as a “normative personality” they are embracing scholars (professors, researchers, students, learners) in pursuit of a class of specific purposes for the advancement of knowledge.

For simplicity, in some of the figures below we shall be using the term “university” as a proxy for “research organisation”. However, it is important to note that in the political

frames of various societies we find a large variety of organisations engaged in research. Universities have different “owners” or “founders” who pursue their own interests, i.e. different “missions” or “purposes”. In European history, the first university at Bologna was reportedly founded in 1088 (Wikipedia, 2018e). Reportedly, the first doctoral degree was awarded in 1219 after Pope Honorius III had accepted the rules for doctoral promotions. Against the interest of the popes, in 1224 the German emperor Frederick II had founded the first non-sectarian university in the world “University of Naples Federico II”, i.e. the first university dedicated to training secular administrative staff, to train administrative and skilled bureaucratic professionals for the kingdom’s ministries and governing apparatus, as well as preparing lawyers and judges who would help the sovereign to draft laws and administer justice.

That kind of competition between founders and variety of political orientations holds till today. For example, in the 1970s in Germany and Austria, when social democratic governments came to power, they expanded and re-shaped existing research organisations through new university-organisation laws among others with the aim to provide employment opportunities for scholars with social democratic orientation (e.g. in Germany Augsburg 1970, Bremen 1971, etc.; in Austria, Linz 1966, Klagenfurt 1970, etc.).

Since its foundation in 1915 The American Association of University Professors pursues the purpose, i.e. its mission, of supporting principles of academic freedom and the quality of higher education in a free and democratic society (AAUP, 2018b).

The AAUP 1940 Statement of Principles (AAUP, 2018c) strongly emphasises the need and support of academic freedom and tenure:

“Institutions of higher education are conducted for the common good and not to further the interest of either the individual teacher or the institution as a whole. The common good depends upon the free search for truth and its free exposition.

Academic freedom is essential to these purposes and applies to both teaching and research. Freedom in research is fundamental to the advancement of truth. Academic freedom in its teaching aspect is fundamental for the protection of the rights of the teacher in teaching and of the student to freedom in learning. It carries with it duties correlative with rights.

Tenure is a means to certain ends; specifically: (1) freedom of teaching and research and of extramural activities, and (2) a sufficient degree of economic security to make the profession attractive to men and women of ability. Freedom and economic security, hence, tenure, are indispensable to the success of an institution in fulfilling its obligations to its students and to society.” (AAUP, 2018c, p. 14)

In comparison with Maslow’s rank order of needs (Maslow, 1943, 1970; see also Wikipedia, 2018d) we note that the claim of academic freedom addresses a broad range of needs which are to be satisfied to make advancement of knowledge possible:

Based on Maslow’s theory we find six classes of needs and desires pursued by individuals:

- (1) physiological needs;
- (2) safety needs;
- (3) social belonging;
- (4) esteem;
- (5) self-actualisation; and
- (6) transcendence.

A precondition for advancement of knowledge and truth is that for individual researchers at least the first five classes of satisfaction of needs, if not all six, are to be met:

- (1) ad1. not losing shelter and food supply;
- (2) ad2. not being personally threatened;
- (3) ad3. belonging to a cooperative research group in pursuit of the same or similar research goals;
- (4) ad4. enjoying esteem for major achievements;
- (5) ad5. a researcher can reach her or his full potential;
- (6) ad6. and reaching transcendence, i.e. the capacity of surpassing one's usual limits and of being; and
- (7) ad7. free from the constraints of the material world.

Fink and Yolles (2016) identified eight major cultural types, which possibly arise within all societies, however with different and varying intensity or size of dedicated population to one of these political orientations. These major cultural types find a reflection in divergent programs of competing political parties and also within different types of organisations.

As can be seen in Table I, the dominant values of the type “Hierarchical Synergism, Republic of letters” (for the notion of “Gelehrtenrepublik” see: Wallnig and Stockinger, 2015) in a way embrace values dominant in universities and other research organisations and operative rules resemble current operative practices. For example, in many universities, the rector is elected by the body of professors and becomes head of a hierarchical organisational structure running the day-to-day business. At the same time professors are intellectual autonomous – a precondition of creativity and a necessary condition for academic freedom – and professors mostly try to maintain a certain degree of harmony among them – as long as their academic freedom is not challenged by one of their colleagues.

Very likely it is academic freedom, which makes universities sustainable over long periods of time. No one can bind the follower of a scholar to pursue the same goals as his predecessor did. Thus, the “natural change” after retirement of a scholar is keeping universities long lasting institutions, because the change in personnel is leading to redirection of the efforts towards advancing knowledge.

Mindset type	Main orientations
<i>Hierarchical individualism</i>	Affective autonomy; intellectual autonomy mastery; hierarchy
<i>Egalitarian individualism individualist anarchism</i>	Affective autonomy; intellectual autonomy. mastery; egalitarianism
<i>Egalitarian synergism social anarchism</i>	Intellectual autonomy. harmony; egalitarianism
<i>Hierarchical synergism, republic of letters (“Gelehrtenrepublik”)</i>	Intellectual autonomy; harmony; hierarchy
<i>Egalitarian left-wing populism</i>	Embeddedness; affective autonomy. mastery; egalitarianism
<i>Hierarchical right-wing populism</i>	Embeddedness; affective autonomy; mastery; hierarchy
<i>Hierarchical collectivism</i>	Embeddedness; harmony; hierarchy
<i>Egalitarian collectivism</i>	Embeddedness; harmony; egalitarianism

Source: (Fink and Yolles, 2016)

Table I.
Major cultural types arising in societies and their dominant values

The variety of political and value orientation within society (as indicated in [Table I](#)) has three theoretical implications:

- (1) Within a society, there is a variety of groups and institutions which are interested in different goals to be pursued and, thus, trying to influence the creation of knowledge to meet their interests. Thus, different groups are interested in different research orientations of universities.
- (2) If specific interest groups become too strong they may gain control over data. This implies that only biased data will be accessible for the population as a whole. However, if there are no right data, decisions will be wrong.
- (3) Differentiation in interests, desires and goals has an impact on options for cooperation between scholars, among universities and research organisations, and between universities and research organisations and organisations/institutions in the social/political environment.

In [Figure 5](#), the complexity of three level interactions is illustrated: the society level, the level of “universities” and research organisations, and the level of scholar personalities. At all three levels certain value orientations are arising, which may be similar, but not necessarily will be similar. At all three levels, values and attitudes are guiding “legitimate” interests, needs and desires. Figurative intelligence permits identification of goals and development of strategies to reach goals, i.e. the purposes of action to be set. Through operative intelligence social systems and individual agents are developing operative structures in support of the pursued purposes and for activation and implementation of operative knowledge, i.e. setting action in an environment.

[Figure 5](#) is thought only as an illustration of interaction between the three levels. It does not imply that individual agents can only interact within the organisation they belong to, or that universities could only interact with the society into which they are embedded. There are thousands of additional options, which, of course, cannot be illustrated in a single figure and cannot be dealt with in a single paper.

With respect options for cooperation between agencies (individuals, or organisations, or institutions) we refer to [Nechansky \(2018\)](#), who identifies eight diverse forms of cooperation within societies, depending on a variety and similarity of purpose and goals:

- ideal cooperation of equals;
- the stipulated cooperation of equals;
- the cooperation of unequals;
- the cooperation of co-operators;
- cooperation via misuse of the power of representatives;
- cooperation with newcomers;
- hierarchical cooperation; and
- altruistic cooperation.

Beyond these eight forms of cooperation, [Nechansky \(2018\)](#) also comes to the conclusion that a precondition of market exchange are unshared individual goal values. Therefore, it is not easy to perceive how selling a product to someone else might trigger cooperative endeavour.

From differentiation of interests, needs, desires, and purposes within societies, the three level interaction model and Nechansky’s theory of cooperation, a couple of problem areas is emerging, which are worth further consideration within the framework of “freedom of

science”: a systemic view of a university, academic freedom, research resources, tenure and cooperation. The related issues are briefly addressed in the following section of the paper.

4. Discussion: freedom and truth

Considering freedom of science and the issue of truth, five major problem areas were identified, which will be worth further analysis:

- A “*systemic view of a university*”: Universities can deliver new and fruitful knowledge, but also can survive suppression, and revive, when suppression is overcome. How come, universities last so long? What are the major systemic characteristics, which last so long?
- Analyses of *current challenges of “academic freedom”* in terms of ethics; protection of individual human rights; political pressures; conflicts of interests.
- The emerging influence of “*fake news*” and creation of “*alternate facts*” most notably through so-called social networks such as Facebook or Twitter.
- The “*competition*” between public and private universities.
- The issue of *the relation between academic freedom and employment* (academic tenure) in present day societies.

In the literature on developments in the field of research and innovation, we find ample references to *issues of cooperation*: cooperation within organisations, cooperation between universities and higher schools of education, cooperation of universities and higher schools of education with corporations, state agencies and international association, etc.

However, very often different things are understood by “cooperation” when referring to the necessities of cooperation: Investigations of cooperation often have a completely different understanding, ranging from any mutual activities, by pursuing mutually stipulated goals, to altruistic services to others. [Nechansky \(2018\)](#) developed an overarching framework to order these definitions and investigates into “cooperation in the widest sense, understood as mutual activity towards mutually accepted goal values. It considers goal-setting processes preceding cooperation, and the resulting different systems of goal values pursued and the related levels of utility achieved by cooperating parties. These different systems of goal-values and achieved levels of utility provide a framework to distinguish eight forms of cooperation: They may express sharing ideals; agreement of equals or unequals; the uniting of cooperating units; the agreement of representatives; the restricted integration of newcomers; hierarchical top-down subjection; or altruistic bottom-up subordination. Finally, it is shown that market exchange neither applies nor leads to any of these forms of cooperation.” ([Nechansky, 2018](#), Abstract).

Thus, as mentioned by [Fink \(2018\)](#) social systems need to have: strategic clarity, knowledge about dependencies of the agency and operative capabilities to set action through a self-organised acting unit and to observe the outcomes of action through an observing unit.

Given the importance of knowledge and resources, researchers and leaders (managers) of their organisations need to understand, among others:

- The value of their knowledge and resources in comparison to other agencies: Who is depending on what and whom?
- Their chances for cooperation: What are the mutual interdependencies between agents with whom a researcher or a research organisation might cooperate?

- What might be joint goals and how can joint strategies be developed and implemented?
- The chances to achieve goal congruence.
- Capabilities of observation of goal achievement and performance.
- Benefits of goal achievement and distribution of benefits from goal achievement between cooperating agents.
- Consequences of failure in goal achievements.
- Competition for resources: Who are the competitors for what resources?
- Risk of being exploited by cooperation partners (e.g. stealing/copying of technological or other scientific knowledge).
- Assessment of alternative strategies, e.g. cooperation vs separation (niche player).

Other issues are related to the interaction between agents (managers) representing the principles and interests dominant within an organisation and the values, attitudes and strategies pursued by individual scholars or small groups of scholars. For example, in a recent e-mail communication of the Proof Reading Services at Devonshire it is recommended that “No matter how important organisation is to a successful scholarly career, however, it is vital not to stick too rigidly to even the most perfect plans when stretching beyond them might benefit your work.” (PRS Devonshire, 2018). Thus, the recommendation is to consider “freedom of science” for decision-making on research preferences, for example:

- What are the implications of recommendations of different international organisations for international education compatibility?
- Do recommendations about cooperation between organisations of the business world, political organisations and research organisations imply that the same goals should be pursued by universities, other research organisations and such organisations?
- What is the background of the demand that scientific results should be commercialised? Would commercialisation have effects on cooperation between agents? Who will gain and who will lose? How can “commercialisation” contribute to regional development? How could commercialisation contribute to meeting socio-economic challenges – which socio-economic challenges?
- How to deal with competition between nations (i.e. a quest for differentiation) and the quest for internationalisation (i.e. a quest for control over other nations). How can “harmonisation” contribute to solving educational, institutional, political, social and economic problems – which might be different in different countries?
- What are the goals of big data social network analyses? Why would it be needed to promote international social networks? Who will gain, who will lose from such developments?
- How strong is the link between earnings of scholars and teachers with the research and education outcomes? Do financial incentives (rewards and incomes) matter for development of human capital? What about non-financial incentives (awards and honour)?

5. Conclusions

Considering the personal experiences of the author and those of numerous other scholars with issues of freedom of science (as a learner, teacher, researcher or publisher) the social

viable systems model provides a framework of variables (factors) which influence actual practical activities of researchers and institutions, which are embedded into a larger cultural, social and political framework. One must not forget that any research finding, which serves representatives of a particular political stream of thought (e.g. a political party), is very likely against the interest of another – opposing stream of thought (a competing political party).

In publicised discussion about the “importance of international harmonisation” of scientific research and higher education, as well as the importance of “cross-sector cooperation” and “cross-country cooperation”, we are confronted with a long series of arguments. Many recommendations claim that cooperation across business sectors, countries, and education systems might contribute to more effective research results, without considering the necessary conditions for cooperation within and across systems, and without considering the issues which emerge from competition between firms, organisation, and nations.

Considering recent developments, it is obvious that the issues related to Freedom of Science and Truth will be prevailing, e.g., the recent communication about the new issue of the journal “Academe” (Winter 2019), i.e. a journal of the American Association of University Professors, reports that: “This issue of Academe addresses the questions of speech that have fuelled the culture wars on college campuses in recent years. Articles discuss the assault on the public mission of higher education; the implications of a polarised political climate for faculty members, administrators, and students; and the parameters of current debates about academic freedom, free speech, and inclusion”.

In Austria, during February 2019, several news releases indicated that the so far independent statistical office of Austria “Statistik Austria” should lose its independence and be subordinated to the Office of the Federal Chancellor. That news triggered an outburst of arguments against closer ties of the statistical office with the Chancellors Office. Numerous political agents and the Director General of the National Statistical Office claim that the organisation “Statistik Austria” should rather be subordinated to the Austrian Parliament than more closely tied to the Chancellor’s Office. The general fear is that there will be a constraint on data, and right data will not be available. Consequently, decisions based on wrong data will be wrong, too.

Note

1. This is a revised and extended version of a keynote speech delivered at the BSLab 2019 International Symposium: BORDERS WITHOUT BORDERS: Systemic frameworks and their applications for sustainable well-being in the global era. University of Pavia, Italy, 21 January 2019.

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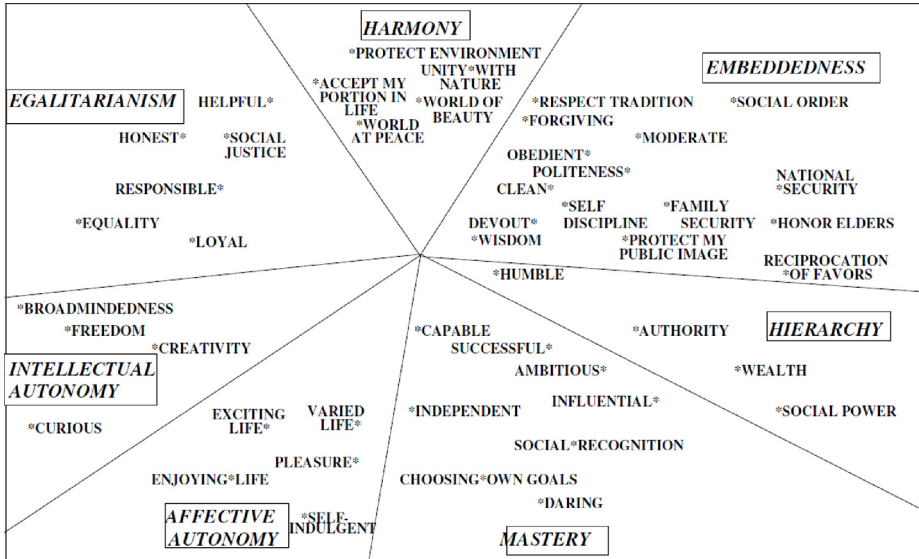


Figure A1.

Source: Schwartz (2006) A Theory of Cultural Value Orientations: Explication and Applications, Comparative Sociology, Volume 5, issue 2-3, p. 147

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